Abstract

Title: Cardiorespiratory and hemodynamic response during incremental climbing test in elite sport climbers.

Objectives: The aim of this work is to compare cardiorespiratory and hemodynamic response during incremental climbing test between boulderers and lead climbers.

Methods: Five men underwent testing on a climbing ergometer with a submaximal climbing load (6m / min) and an incremental climbing test for the maximum. The cardiorespiratory response was assessed using a metabolic analyzer and tissue saturation of the flexor digitorum profundus by near-infrared spectroscopy. Furthermore, climbers underwent an incremental stress test on a running carpet.

Results: Climbers with both lead and bouldering reached on climbing ergometer an average of 95 ± 3% of the maximum heart rate measured on the running ergometer. V'O2 $ml \cdot min^{-1} \cdot kg^{-1}$ had lead climbers slightly lower too on the running ergometer, (81 ± 8%, boulders 89.5 ± 0.5), but at the same time they reached a higher inclination (121, 7 ± 4.7 versus 117.5 ± 2.5) and longer duration (462 ± 73, boulder 443.37). We found the difference in the TSI values, too, but it was not larger than 7.2 for which I did not consider these values to be relevant.

Conclusions: Deoxygenation and reoxygenation process showed minimal difference between lead climbers and boulderers. Maximum oxygen consumption on climbing ergometry was almost the same, but lead climbers reach it in higher angle and after longer period of time. Differences in VO2 peak between lead climbers and boulderers were minimal.